Disease Detectives

Georgia State Elementary Science Olympiad

May 10, 2003

Team Member Names: **Answer Key**

Note: For fill-in-the-blank questions, not all possible

School: **answers are provided.**

Problem 1. (4 points total) – Please go to Station A. For each item, name two diseases or health problems caused by the item.

Item 1 (cigarette): lung cancer, heart disease, chronic lung disease,

vascular disease

Item 2 (smokeless tobacco): oral (mouth) cancer, tongue cancer,

poor dentition (teeth problems), bad oral hygiene

Problem 2. (9 points total) – Please go to Station B (swimming pool).

For this problem, think about different **kinds** of health problems and dangers that can be present at public swimming pools. Identify three different **kinds** of health risks, and two ways to prevent each health risk.

Health Risk or Danger	Prevention Methods
Drowning	(1) swim lessons; floatation devices; (2) lifeguard; don't dive in shallow water
Falls, Trips, Slips	(1) don't run; no horseplay; (2) pick up trip hazards
Water-borne diseases	(1) don't drink water; keep human waste out of pool; (2) maintain chlorine level; maintain purification system
Sunburn	sunscreen; wear hat; cover body; stay out of midday sun

Problem 3. (5 points)

Health department Disease Detectives helped two high schools – Elm School and Oak School – to do surveys to identify how many students have tried smoking cigarettes. The results of the survey are given in this table:

school	total students	students smoking cigarettes
Elm	100	50
Oak	400	100

As the chief health officer, if you could chose which school to visit to educate kids about the health problems related to smoking, which school would you choose and why?

(a) school: _Either school could be correct__

(b) reason for choosing school: _Either the higher proportion (Elm School) or the higher

____number (Oak School) of students who tried cigarettes._____

Problem 4. (6 points total) – Please go to Station C (hamburger meat).

(a) Name something (an agent, organism, or other biologic thing) that can cause sickness or disease in humans if present in this item.

_bacteria; viruses; parasites; microbial agents; fat__

(b) For this item, list one health problem (a kind of illness, disease or condition) that might result from eating this item.

_vomiting; diarrhea; gastroenteritis; heart disease; obesity__

(c) Give one way to prevent health problems that might result from eating this item.

_cook thoroughly; wash hands after handling; don't eat until cooked; eat leaner meats__

Problem 5. (9 points total) Match the following terms. Write the letter for the term in column B in the space for the correct term in column A. Each term in column B is used only once.

A	B
_d_ alcohol	a. obesity, or being seriously overweight
_e_ surgical gloves	b. risk factor for skin cancer
_b_ sunburn	c. only disease ever eradicated
_g_ smoke detector	d. risk factor for liver disease
_i_ cigarette smoking	e. prevent hospital infections
_h_ vaccination	f. prevents injuries in crashes
_a_ poor diet	g. important part of a fire safety plan
_f_ seat belt	h. measles prevention
_c_ smallpox	i. leading cause of preventable deaths in USA

Problem 6. (8 points total) – Please go to Station D (mosquitoes).

(a) List one human health problem or disease associated with this insect.

_Malaria; West Nile Virus; encephalitis_____

(b) On the following lines, briefly explain how people may get sick from contact with this insect.

_Good explanation of: vector cycle; inoculation into susceptible host; parasites

_____

(c) Give 2 ways to prevent health problems caused by this insect.

(1) _Wear long sleeves; wear insect repellent; larvicide in standing water;_

(2) _stay indoors when mosquitoes are most active (dawn and dusk)__

Problem 7. (9 points total) – Please go to Station E (table of data about students who visited the zoo).

A class from a school visited the zoo on a field trip. As part of the trip, the class had a chance to pet a large lizard in the reptile house. After visiting the reptile house, the class had lunch. Some students bought lunch at the zoo and some brought their lunch from home. After lunch, they returned to school. Later in the day, some of the students got sick. Disease Detectives were called in to investigate the outbreak. They asked each student what they did before they got sick. The students' answers are in the table.

(a) The Disease Detectives decided that it wasn't lunch that made some students sick. How did they use the information about lunches from the data table to make that decision?

Because similar proportions of students who brought their lunch from home (6 of 14, 43%) and who bought their lunch at the zoo (5 of 11, 45%) got sick.

(b) What activity probably made the students sick? Again, using information from the data table, how do you know?

Petting the lizard (and not washing their hands before eating) is probably what made the students sick. 10 of 13 students who petted the lizard got sick (77%); only 1 of 14 students who didn't pet the lizard got sick (7%).

(c) How could this outbreak have been prevented?

Students should have washed their hands before eating; especially after handling an animal.

Problem 8. (10 points total) – Please go to Station F (graphs of TB data).

Tuberculosis or "TB" is an infectious disease. It is caused by a bacterium that usually infects the lungs. TB is spread through the air from person to person. When someone with TB coughs, sneezes, or otherwise sprays TB germs from their lungs, someone else can breathe them in and get infected with TB. Answer the questions below by looking at the two graphs.

Using Figure 1, answer the following questions:

1. A case rate is the number of cases of a disease divided by the size of the population being studied. What was the national average TB case rate in 2001?

   _____5.6_____ cases per 100,000

2. How many states had TB case rates that were greater than the national case rate?

   _____14**_____ states **Note: Washington, DC is not a state and New York City is part of the state of New York.

3. Where do TB case rates tend to be higher?
   a. In the Northeast part of the country.

   b. In the Southeast part of the country. Item b is the correct answer.

   c. Case rates are basically the same everywhere.

Using Figure 2, answer the following questions:

4. Which of the following statements is **false**?
   a. There were more TB cases in 1993 than in 1984.

   b. For the years shown in the Figure, the year with the fewest TB cases was 2001.

   c. For the years shown in the Figure, the only year when there were fewer than 20,000 TB cases was 1999. Item c is the correct answer.

5. How many TB cases were there in the United States in 2001?
   a. About 10,000

   b. About 25,000

   c. About 16,000 Item c is the correct answer.

   d. Cannot tell from the Figure